



# MEASUREMENT OF INTELLECTUAL CAPITAL

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## ABSTRACT

Intellectual capital (IC) includes intangible assets that are the real source of the creation of value in a company. Intellectual Property includes assets which help it in adapting to fast change environment and the ability to create future value creation either through in-house research or through the purchase of new technology from outside. The measurement of IC has become very relevant and more and more statutory bodies are recognizing the needs of standardizing the accounts standards and include IC in balance sheet. Valuation of IC is very essential to truly determine the value of an enterprise. If the company brings out its own value of IC, then it will be subjected to creative accounting. Standardization of the complete framework of IC will take time and sustained efforts and hopefully accounting standards will inculcate IC values in balance sheets. But yes, before that the journey of valuation of IC will continue.

**KEYWORDS:** Immaterial assets, Intangible assets, Calculated Intangible Value (CIV), Intellectual capital (IC).

## INTRODUCTION:

Intellectual capital includes intangible assets that are the real source of the creation of value in a company. Intellectual Property includes assets which help it in adapting to fast change environment and the ability to create future value creation either through in-house research or through the purchase of new technology from outside. Intellectual capital includes all the resources of an undertaking which depicts its competitiveness in the market. Relational capital, human capital and organizational capital are the important elements of intellectual capital. The relationship between the organization and the vendors, supply chain partners, customers, innovation centers are a part of relational capital. Human capital comprises of expert personnel with vast knowledge base and capabilities. The organizational capital includes the decision support system, information management system and the aggregated know-how of all the human and non-human capital.

Intellectual capital can be further classified as:

- A) Intangible assets:** Intangible assets are those assets which do not have any physical existence. These assets can't be touched or seen. Time and efforts are required to create an intangible asset to strengthen demand (goodwill, brand, trademark) and identifiable as separate assets.
- B) Immaterial assets:** Immaterial assets are also those assets which are created over time. These assets improve the efficiency of assets in the production process which transforms inputs into outputs. Firms' use processes standardization, research, and development, etc. as tools for improving the efficiency of inputs for the creation of immaterial assets over time. "Immaterial assets are those assets used in the firm's permanent productive activity, but they are not easily observed, measured and/or quantified. Immaterial values needed are calculated or proxies from immaterial asset and related accounts", Agustín, Escuer and Ramírez Alesón (2005).

## Importance of Intellectual Capital:

The valuation of the identifiable intangible and immaterial assets is based on the following factors:

- a) The advisors and the equity holders for calculating the market valuation of the company and evaluating capacity to turn around in the event of a mis happening., If we look at Satyam's fiasco, we can well think that if in this company immaterial assets are more, the turnaround of the company is very much possible because it can provide services which have quality flowing from the processes of production that have already been established and the knowledge that it has generated and the human capital that it has created over years. However, because of the fraud the brand value, i.e., intangible assets have been eroded which might make its clients run away from the firm. There will be demand erosion due to the diffusion of the brand.
- b) The management measures the performance in terms of productivity, sales, and profit affecting the book value of the firm.
- c) Financiers will be able to use intellectual assets in calculating the borrowing potential of a company when the company needs additional funds. The reputed lending firms have recognized the importance of valuation of the immaterial and intangible assets while securing the loans.

"Firms undertaking innovative activities typically hold specialized equipment and a large share of immaterial assets, such as patents, research knowledge, and project-specific human capital. Hence, more innovative firms tend to have a different capital structure from less innovative ones", Puzzolo, Nucci, and Schivardi (2005).

## REVIEW OF LITERATURE:

Stewart (1997) gave the most appropriate definition of IP as "packaged useful knowledge". A comprehensive definition was given by Brookings (1996) as "combined intangible assets which enable the company to function". We also need to understand that intellectual capital is something different from human brainpower. However, such definitions are just theoretical and don't quantify the IC as of such. For this purpose, lots of researchers have given classifications of components of IC. According to Edvinsson (1997), "IC has three components i.e. Human, Structural and customer capital". Human capital considers the talent, potential and expertise of employees of a company. Structural capital is defined as physical system to transit and store IC. It itself is composed of process and innovation capital. Organizational capital is also be defined as the company's investments in systems, techniques, tools and knowledge mechanism within company. Innovation capital refers to the intellectual property, commercial rights which includes trademarks and copyrights. Process capital is one of the work process technique of employees under ISO 9000 for enhancing manufacturing and service delivery mechanism. Customer capital includes indices like satisfaction, longevity and financial well-being of customers.

Another classification was given by Annie Brooking (1999) which says that "IC can be dividing into mainly 4 categories i.e. Market, Intellectual property, Human centered and Infrastructure assets". Market assets covers the brand positioning company name, distribution etc. IP includes trademarks, copyrights and patents. Human assets include the problem-solving approach, combined expertise, and creativity capabilities along with different skills. Infrastructure assets include management philosophy, corporate culture, financial relations and IT systems.

Intellectual capital has gained importance in the last decade because of rise of key technical areas include IT/ITES sector, media, telecommunication, which has shaped the whole global economy. The organizations increasing dependence on intangible assets can be easily seen. The economists have taken note of this trend way early in 1990s. J. W. Kendrick in his study has concluded that in most advanced technical countries the economic weight of intellectual capital outweighs that of the tangible capital.

Edvinsson and Malone (1997) equated IC with that of roots of a tree which says that IC is the root of the organization which underlies the company and makes it more valuable. The question however is to how to study them and realize these values.

## Methods of Measuring Intellectual Capital:

There are 2 general methods of evaluation of Intellectual capital.

1. Component by component evaluation: This includes valuation of company's human, structural and customer capital.
2. Financial Basis Measurement: There are 3 methods of IC at the organizational level which includes the following.

- a) Market to Book ratio
- b) Tobin's 'q'
- c) Calculated Intangible Value (CIV)

**Market to Book ratio:**

Market to book ratio is based on the premise that the worth of a company is determined by its market value. The market value is estimated by MPS multiplied by the number of the outstanding shares. Intellectual capital is the difference between the book value and market value of the company. However, this method has many shortcomings. Firstly, the share prices are based on many economic factors with are not related with the assets. Secondly, the book values have the depreciated historical cost which never correspond with the fair and true value of tangible assets.

**Tobin's 'q':**

This measure can be computed by using the book value. Here accumulated depreciation is added with the book value after taking adjustment for change in price in various assets. It is based on the proposition that in the stock market, the market value is equal to replacement cost.

If q is higher than one and q is also higher than the value of its rival company, then the company has an advantage and capability to produce more profits because of an intangible factor which is IC. However, it suffers from drawbacks like how to adjust for price changes and get replacement costs which all have been hypotheses.

**Calculated Intangible Value (CIV):**

CIV is a method which helps the companies in estimating the value of its intangible assets. This method is built on the assumption that both the tangible and intangible assets are reflected by the market value of the company. The value of IC can be calculated in seven steps as under:

1. Estimate the average EBIT (Earnings before interest and tax) for last 3 years.
2. Estimate the average tangible assets for last 3 years.
3. Calculate Return on Assets (ROA) by using the equation as under:

$$\text{Company's Average ROA} = \frac{\text{Average EBIT for last 3 years}}{\text{Average Tangible assets for last 3 years}}$$

4. Calculate the Industry Return on Assets (IROA) for last three years by using the equation as under:

$$\text{IROA} = \frac{\text{Average EBIT of Industry for last 3 years}}{\text{Average Total Assets of Industry for last 3 years}}$$

5. Calculate [IROA × Average Tangible assets] and subtract the same from the average EBIT to get excess returns.
6. Calculate the average income tax rate of last three years and multiply the same by excess returns. The result from the same would be subtracted from surplus return to attain after tax premium attributing to intangible assets.
7. NPV of this premium is calculated by the following equation:

$$\text{NPV (Premium)} = \frac{\text{Premium}}{\text{Cost of Capital}}$$

It gives the value of intellectual capital in terms of currency. This value is termed as calculated Intangible value (CIV). CIV tells about the ability of the intangible assets of a company to beat the competitors. n

Market Value of Intangible Assets = Market capitalisation - Tangible Assets

The Market value will reflect about the cost for new entrant to generate the intangible assets from scratch. The values of all relevant data can be easily obtained from databases like PROWESS.

**LIMITATIONS:**

The limitation of this model is it cannot be applied in case of the companies whose Return on Assets (ROA) is less than Industry average ROA.

**Skandia Model:**

Organization IC as defined by Edvinsson and Malone (1997) was "iC" where 'C' is some absolute value of intellectual capital in currency and 'i' is the organization's coefficient of efficiency. Some of the prominent IC Absolute measure (C) Indicators is:

1. New Market Development Interests: This includes expenditure on development of new customers and clients like advertisements spend.

2. Industry development investment: This index measure participation of company in industry wide efforts like trade organizations, salaried to executives etc.
3. Change in IT development: Amount spent on IT initiatives.
4. Employee Training and development Investment: This includes training for both part time and full-time employees regarding products and services for development of skills of employees.
5. Partnership/JV Investment:
6. Upgrade to EDI/Electronic Networking System.
7. New Patents/Copyrights: This includes investment on acquisition of new patents and copyrights purchased.

$$\text{The coefficient is } C = \frac{N}{X}$$

Where 'N' is the sum of the values of seven absolute indices and 'X' is the number of those indices. Also, to be noted is that this list is not definitive and exhaustive and other indices may be included as per industry. This list emphasizes what investors need to know about future value of company.

The next step is to create a countervailing figure that test these investments against real life productivity and value creation which is denoted by Coefficient of efficiency (i)

IC Coefficient 'i' Indicators are:

1. Market Share (%): This is computed based on revenue generated by company in the year and total revenue of the Industry. This data is available in various sites and databases.
2. Customer Satisfaction Index (%): this is generally tested using a questionnaire and gauging the judgment and satisfaction level of customers. It mainly insists on three factors: Quality of product and services, after and before sales service and overall satisfaction level of customers.
3. Leadership Index (%): This index checks the leadership skills of managers in the company. This is again conducted using questionnaire method and value is generated using different methods.
4. Motivation Index (%): This measure calculates the motivation level of employees of company and conducted through questionnaire. To measure motivation 3 key elements are judged:
  - Performance Outcome expectancy.
  - Valence of Outcome
  - Effort performance Expectancy.
5. Index of R&D Resources/Total Resources (%): This measure the fund allocated to R&D out of the total resources. This index is calculated using the following formula:

$$\frac{\text{R\&D Expenditure during the year}}{\text{Profit after Tax + Depreciation}} \times 100$$

6. Index of Training Hour (%): It reflects the percentage of time the company devotes to training & development which is crucial to competitiveness.
7. Employee retention (%): It is measured as (1-Employee turnover ratio). Employee turnover ratio is calculated as follows:

$$\frac{\text{No. of Employees left during the year}}{\text{No. of year beginning employees + Number of year ending employees}}$$

The coefficient 'I' is calculates as (n/x) where 'n' is summing total of all efficiency indices and 'x' is the number of indices. Also, to be noted is that this list is not definitive and exhaustive and other indices may be included as per industry. The value of IC is obtained by product of 'I' and 'C' using Skandia Model.

**LIMITATIONS OF MODEL:**

First, this model requires lot of efforts, time and money to calculate all the values. Moreover, a lot of subjectivity is present which may not allow for comparison between different companies as efficiency parameters can easily be manipulated and are not standardized.

**CONCLUSION:**

The measurement of IC has become very relevant and more and more statutory bodies are recognizing the needs of standardizing the accounts standards and include IC in balance sheet. Valuation of IC is very essential to truly determine

the value of an enterprise. We have however tried to find two ways of determining the value of intellectual capital at both organizational and component by component level. Calculated Intangible Value (CIV) value is based on financial variables and can be considered as an alternative performance measurement tool. However, it does not give insights into components of IC and does not help in strategy formulation.

Skandia Model measures not only financial measures but also current human structural and customer performance which are directly linked to financial management. According to this model IC is a measure of both size and efficiency. The value of IC found through this method needs to be compared with other competitors and then investors can evaluate and rank the performance of a company. However, these methods will only be useful if these are standardized throughout the industry. If the company brings out its own value of IC, then it will be subjected to creative accounting and SATYAM scandals will resurface.

So far there are no standards methods for valuation of IC. Researchers and professional bodies like bodies like ICAI, FASB, and CICA are doing their parts by coming out with different standards and possible valuation methods. Standardization of the complete framework of IC will take time and sustained efforts and hopefully accounting standards will inculcate IC values in balance sheets. But yes, before that the journey of valuation of IC will continue.

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